

Amendments to the Claims

Claims 15-30 are withdrawn.

Please amend claim 33 as indicated in the listing of claims.

Please cancel claims 1-14, 31 and 32 without prejudice or disclaimer.

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-14. (Canceled)

15. (Withdrawn) An analysis chamber comprising: a resonant cavity to contain a sample for analysis; at least one window to the cavity to transmit a first electromagnetic radiation having a first frequency into the cavity and to transmit a second electromagnetic radiation having a second frequency out of the cavity; and a plurality of reflectors affixed to a housing of the cavity to reflect radiation of a predetermined frequency, the plurality of reflectors separated by a distance that is sufficient to resonate the radiation of the predetermined frequency.

16. (Withdrawn) The system of claim 15, wherein: the cavity comprises a micro-sized cavity contained within a solid substrate; the micro-sized cavity has a volume that is not greater than one microliter; and the cavity is coupled with a micro-sized fluid channel to receive the sample for analysis.

17. (Withdrawn) The system of claim 15, wherein the at least one window comprises a partial reflector of the plurality of reflectors to transmit the second electromagnetic radiation out of the cavity.

18. (Withdrawn) The system of claim 15, wherein the plurality of reflectors comprises a reflector and a partial reflector, the reflector having a reflectivity for the first and second

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radiations that is greater than 99%, and the partial reflector having a reflectivity for the second radiation that is not greater than 99%.

19. (Withdrawn) The system of claim 15, wherein: the plurality of reflectors comprise a multi-layer dielectric mirror; and the second radiation comprises inelastically scattered Raman radiation.

20. (Withdrawn) The system of claim 15, further comprising the sample contained within the cavity, the sample containing a single nucleic acid derivative in solution, the nucleic acid derivative comprising a single base that is selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil.

21. (Withdrawn) A spectroscopic analysis system comprising: an electromagnetic radiation source to provide a first electromagnetic radiation; a spectroscopic analysis chamber comprising: a resonant cavity to contain a sample for analysis, at least one window to the cavity to transmit the first electromagnetic radiation into the cavity and to transmit a second electromagnetic radiation out of the cavity, and a plurality of reflectors affixed to a housing of the cavity to reflect radiation of a predetermined frequency, the plurality of reflectors separated by a distance that is sufficient to resonate the radiation of the predetermined frequency; and an electromagnetic radiation detector to detect the second electromagnetic radiation.

22. (Withdrawn) The system of claim 21, wherein: the first electromagnetic radiation comprises a radiation that is suitable for Raman spectroscopy; the cavity comprises a micro-sized cavity, having a volume that is not greater than one microliter, contained within a solid substrate; the cavity is coupled with a micro-sized fluid channel to receive the sample for analysis; and the plurality of reflectors includes first multi-layer dielectric mirror having a reflectivity for the second radiation that is greater than 99% and a second multi-layer dielectric mirror having a

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reflectivity for the second radiation that is not greater than 99%; and the second radiation comprises radiation having a frequency that has been shifted from a frequency of the first radiation based on an inelastic interaction with the sample.

23. (Withdrawn) The system of claim 21, further comprising a nucleic acid sequencing system containing the analysis system, the nucleic acid sequencing system comprising: a sampling system to provide samples to the analysis system; and a sample within the cavity, the sample containing a single nucleic acid derivative in solution, the nucleic acid derivative comprising a single base that is selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil.

24. (Withdrawn) A method comprising analyzing a sample containing a single molecule of interest with a coherent Raman spectroscopy.

25. (Withdrawn) The method of claim 24, wherein the coherent Raman spectroscopy is selected from the group consisting of a stimulated Raman spectroscopy and a coherent anti-Stokes Raman spectroscopy.

26. (Withdrawn) The method of claim 24, wherein analyzing comprises analyzing a single nucleic acid derivative with a coherent anti-Stokes Raman spectroscopy.

27. (Withdrawn) The method of claim 26, wherein analyzing with the coherent anti-Stokes Raman spectroscopy comprises: irradiating the nucleic acid derivative with a first radiation having a first wavelength and a second radiation having a second wavelength, wherein the first and the second radiation are substantially phase matched; subsequently irradiating the nucleic acid derivative with a third radiation having the first wavelength; and detecting a fourth radiation emitted by the nucleic acid derivative after irradiation with the third radiation, the fourth

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radiation containing a coherent beam having a predetermined direction and a third wavelength that is related to the first and the second wavelengths.

28. (Withdrawn) The method of claim 26, further comprising identifying the nucleic acid derivative based on the analysis.

29. (Withdrawn) The method of claim 27, further comprising geometrically separating the fourth radiation from the first and the second radiations.

30. (Withdrawn) The method of claim 29, wherein geometrically separating comprises irradiating the nucleic acid derivative with beams of the first, the second, and the third radiations from predetermined directions that allow photons of the beams to be combined according to momentum conservation to cause the nucleic acid derivative to emit photons in the predetermined direction.

31-32. (Canceled)

33. (Currently Amended) The method of claim ~~[[32]]~~ 36, wherein analyzing comprises analyzing with a stimulated Raman spectroscopy.

34. (Original) The method of claim 33, wherein the sample comprises a nucleic acid derivative.

35. (Original) The method of claim 34, further comprising identifying the nucleic acid derivative based on the analysis.

36. (New) A method comprising:

- a) irradiating a sample containing a plurality of molecules of interest in a resonance chamber;
- b) selectively resonating inelastically scattered radiation characteristic of a first target molecule in the chamber;
- c) transmitting the selectively resonated radiation from the chamber;
- d) detecting the transmitted radiation;
- e) selectively resonating inelastically scattered radiation characteristic of a second target molecule in the chamber;
- f) detecting the transmitted radiation; and
- g) optionally repeating e) and f) for additional target molecules in the plurality of molecules.

37. (New) A method comprising:

- a) irradiating a sample containing a set of molecules of interest in a resonance chamber;
- b) selectively resonating inelastically scattered radiation characteristic of an average wavelength associated with the set of molecules in the chamber;
- c) transmitting the selectively resonated radiation from the chamber;
- d) detecting the transmitted radiation; and
- e) optionally identifying a particular derivative of the set of molecules of interest based upon detecting a derivative-specific frequency shift in the transmitted radiation.

38. (New) The method of claim 37, wherein the set of molecules of interest are a set of nucleotides.

39. (New) The method of claim 38, wherein the particular derivative is a specific nucleotide.

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